UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

November 29, 1995

Mr. Pete Tuttle
US Fish & Wildlife
fax 702-784-5870

Dear Pete:

I appreciate any thoughts that you and your colleagues may have concerning the potential hazards to avian populations from the proposed evaporation, raffinate, and pregnant leach ponds associated with a proposed in-situ mining operations. This is a new facility that is under consideration for a Class III underground injection well permit. Jeanne Dunn-Geselbracht of our office suggested that you may have had some prior experience with similar mining operations.

The company plans to fence the evaporation, raffinate, and pregnant leach ponds. They are, however, adverse to netting of the ponds to prevent access of birds. Their position is that netting is not necessary since the pools are sulfate-based vs. cyanide-based. According to their representative, sulfate-based solutions are not attractive to birds and the birds will instead use the freshwater sources that are nearby. (Freshwater sources, according to information received, includes; a golf course, man made lakes, irrigation ditches, and a series of canals which are very close to the site.)

In addition, the company questions the regulatory nexus for requiring netting for copper mining process ponds. While the netting per se is not required, I believe that if the solutions in the ponds are hazardous to birds, and if birds are attracted to the ponds, the company may need to provide some mechanism to prevent access to the ponds or eliminate the hazard. (Requirement of the Migratory Bird Act.) If the constituents in the solutions are hazardous but birds are not attracted to the ponds, perhaps the company may need to document this through a monitoring program.

I have enclosed a diagram of the proposed site showing the location of the ponds. The raffinate pond and pregnant solution pond will each be approximately 1/2 acre (100 ft. x 200 ft). The 8 evaporation ponds will be a total of 77 acres (of wet surface only). The evaporation ponds will be equipped with sprayers. Each pond will be lined to prevent contamination of groundwater. Additionally, there will be one freshwater pond, 1 acre in size, immediately adjacent to the evaporation ponds.

I am specifically interested in learning what levels of contaminants may be toxic or hazardous to bird species if they come in contact with the solution containing the contaminants. (Attached is a listing of the constituents that will comprise the solutions found in the proposed ponds.) Also, if you have knowledge of similar mining operations or operations which have large pools of sulfate-based or cyanide-based solutions, I would be interested in learning about problems the facility may have had with bird populations.

Thank you for your help. I look forward to any information you can share with us. If you have any questions or comments, please contact me at (415) 744-1832.

Sincerely,

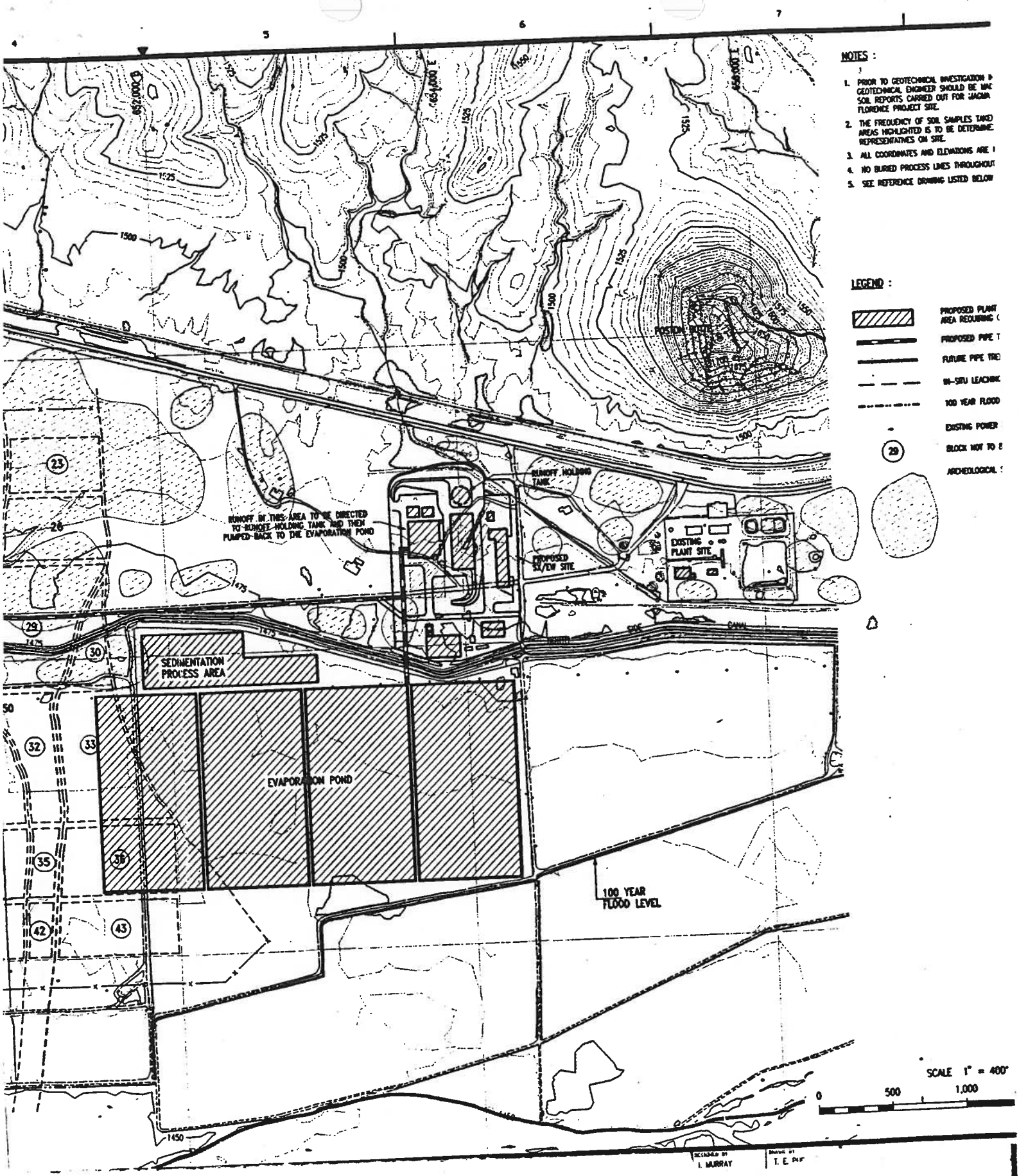
Judy L. Bloom
Sourcewater Protection Section

Magma Copper Company
Florence Project
Estimated Characteristics of Process Impoundment Solutions

Impoundment/Tank	Pregnant Leach and Raffinate Ponds	Evaporation/Salt Pond	Storm Water/Spill Control Tank
Normal Condition	Always in use	Always in Use	Rarely used. Use during spills and storm events.
pH	1.7-2.2	6.5-7.2	6.5-8.5
Phosphorous, mg/l	60-100	Not Detected	0-100
Sulfate, g/l	90-110	40-110	0-100
Aluminum, g/l	8-10	35	0-10
Antimony, mg/l	<0.1	0.2	<0.1
Arsenic, mg/l	5-6	30	0-6
Barium, mg/l	<0.2	<1.0	<0.2
Calcium, g/l	0.5-0.7	0.2	0-0.7
Chromium, mg/l	4-9	120	0-9
Cobalt, mg/l	20-22	20-22	0-22
Copper, g/l	0.2-4.0	<1.0	0-4
Iron, g/l	1.5-2.0	<1	0-2
Lead, mg/l	<1	<1	<1
Magnesium	9-11	Saturated Magnesium sulfate	0-2
Manganese, mg/l	1-2	<1	0-2
Mercury, mg/l	<0.01	<0.01	<0.01
Nickel, mg/l	20-25	<1	0-25
Potassium, g/l	0.07-0.08	0.25	0-0.08
Selenium, mg/l	<0.1	<0.1	<0.1
Silver, mg/l	<0.01	<0.01	<0.01
Zinc, g/l	0.05-0.2	<0.2	0-0.2
TDS, g/l	90-120	Saturated magnesium sulfate	0-120
Estimated size, acres	<1	100	<0.1

Notes:

1. The evaporation pond will be equipped with evaporation sprayers which will deter birds from landing.
2. The run-off tank is used only in emergencies or during storm events and generally will be maintained empty.
3. Some analyses are listed in milligrams per liter (mg/l00) and the other are listed in grams per liter (g/l).


NOTES :
1. PRIOR TO GEOTECHNICAL INVESTIGATION P
GEOTECHNICAL ENGINEER SHOULD BE MA
SOIL REPORTS CARRIED OUT FOR SAGAMA
FLORENCE PROJECT SITE.
2. THE FREQUENCY OF SOIL SAMPLES TAKE
AREAS HIGHLIGHTED IS TO BE DETERMINE
REPRESENTATIVES ON SITE.
3. ALL COORDINATES AND ELEVATIONS ARE I
4. NO BURIED PROCESS LINES THROUGHOUT
5. SEE REFERENCE DRAWING LISTED BELOW
LEGEND :
PROPOSED PLANT
AREA REQUIRING
PROPOSED PIPE T
FUTURE PIPE TRE
IN-SITU LEACHIN
100 YEAR FLOOD
EXISTING POWER
BLOCK NOT TO E
ARCHEOLOGICAL
652,000 E
654,000 E
656,000 E
POSTON BUTTE
RUNOFF HOLDING TANK
RUNOFF IN THIS AREA TO BE DIRECTED TO RUNOFF HOLDING TANK AND THEN PUMPED BACK TO THE EVAPORATION POND
PROPOSED SX/EW SITE
EXISTING PLANT SITE
SEDIMENTATION PROCESS AREA
EVAPORATION POND
100 YEAR FLOOD LEVEL
SCALE 1" = 400'
0
500
1,000
I. MURRAY
T. E.